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WHAT ARE LEARNING STRATEGIES?

As students shift from the skills emphasis of elementary grades to the content emphasis of secondary grades, they face greater demands to read information from textbooks, take notes from lectures, work independently, and express understanding in written compositions and on paper and pencil tests (Schumaker & Deshler, 1984). For students

who haven't acquired such important academic skills, the task of mastering content often comes with failure, particularly in inclusive general education classes. In response to this challenge, many students with learning problems, including those with learning disabilities (LD), have acquired and use specific learning strategies to become successful despite their knowledge and skill deficits.

Simply put, a learning strategy is an individual's approach to complete a task. More specifically, a learning strategy is an individual's way of organizing and using a particular set of skills in order to learn content or accomplish other tasks more effectively and efficiently in school as well as in nonacademic settings (Schumaker & Deshler, 1992). Therefore, teachers who teach learning strategies teach students how to learn, rather than teaching them specific curriculum content or specific skills.

WHAT DOES THE RESEARCH SAY ABOUT LEARNING STRATEGIES?

Much of the research and development of learning strategies for students with learning disabilities has come from researchers and educators affiliated with The University of Kansas, Center for Research on Learning. In general, their research suggests that use of learning strategies can improve student performance in inclusive settings or on grade appropriate tasks. In reading, for example, results from a study of the use of the Word Identification Strategy indicated that the number of oral reading errors decreased while reading comprehension scores increased for all students on ability level and grade level materials (Lenz & Hughes, 1990). Another study revealed that students using the Test Taking Strategy improved average test scores in inclusive classes from 57% to 71% (Hughes & Schumaker, 1991).

Other researchers in the area of learning strategies have also found positive results. For example, Graham, Harris, and colleagues (e.g., Graham, Harris, MacArthur, & Schwartz, 1991) have validated strategies for improving the quality of student compositions, planning processes, and revisions. In another line of research, Palincsar and Brown (e.g., Palincsar & Brown, 1986) successfully tested and replicated reciprocal teaching, a strategy to improve student reading performance. Scruggs and Mastropieri (e.g., Scruggs & Mastropieri, 1992) have validated several approaches to teach students how to construct and use mnemonics. Strategies tested by Miller and Mercer (e.g., Miller & Mercer, 1993) have resulted in improved student performance in math calculations as well as in solving word problems.

HOW DO TEACHERS TEACH LEARNING STRATEGIES?

Educators at the University of Kansas, Center for Research on Learning, have validated an instructional sequence in which students learn each strategy following these

teacher-directed steps: (a) pretest, (b) describe, (c) model, (d) verbal practice, (e) controlled practice, (f) grade-appropriate practice, (g) posttest, (h) generalization (Schumaker & Deshler, 1992). After a teacher assesses the current level of student performance on a strategy pretest, students commit to learning a new strategy. The teacher then describes the characteristics of the strategy and when, where, why, and how the strategy is used. Next, the teacher models how to use the strategy by "thinking aloud" as the strategy is applied to content material. During the verbal practice step, students memorize the strategy steps and other critical use requirements. Afterwards, controlled practice activities enable students to become proficient strategy users with ability level materials. Teachers provide specific feedback on performance, and then students use the strategy with grade-appropriate or increasingly more difficult materials. Finally, after a posttest, teachers facilitate student generalization of strategy use in other academic and nonacademic settings.

Each strategy has multiple parts that students remember with the aid of a mnemonic. For example, in the Paraphrasing Strategy (Schumaker, Denton, & Deshler, 1984) students learn a reading comprehension strategy that is remembered by the acronym RAP:

- *Read a paragraph

- *Ask yourself, "What were the main idea and details in this paragraph?"

- *Put the main idea and details into your own words.

If students need to learn prerequisite skills, such as finding main ideas and details, teachers teach those before teaching the strategy, and reinforce student mastery of those skills during strategy instruction. Students typically learn to use a learning strategy in small groups, sometimes in a resource room, through short, intensive lessons over several weeks.

WHAT RESOURCES ARE AVAILABLE FOR TEACHERS?

The learning strategies curriculum developed at the University of Kansas is organized into three strands: (a) information acquisition, (b) information storage, and (c) expression and demonstration of understanding.

The information acquisition strand features the Word Identification Strategy, the Paraphrasing Strategy, and others. The Word Identification Strategy (Lenz & Hughes, 1990) enables students to decode multisyllabic words. Students use the Paraphrasing Strategy (Schumaker, Denton, & Deshler, 1984) to improve reading comprehension of main ideas and details through paraphrasing.

The information storage strand includes the FIRST-letter Mnemonic Strategy, the Paired Associates Strategy, as well as others. Students who master the FIRST-letter

Mnemonic Strategy are able to scan textbooks to create lists of critical information and devise first letter mnemonics to remember the material (Nagel, Schumaker, & Deshler, 1986). To better study and recall content, the Paired Associates Strategy enables students to pair pieces of new information with existing knowledge by using a visual device (Bulgren, Hock, Schumaker, & Deshler, 1995).

The expression and demonstration of understanding strand includes the Sentence Writing Strategy, the Test Taking Strategy, and others. The Sentence Writing Strategy is designed to teach students how to write simple, compound, complex, and compound-complex sentences (Schumaker & Sheldon, 1985). The Test Taking Strategy is an integrated strategy used by students to focus attention on critical aspects of test items, systematically answer questions, and improve test performance (Hughes & Schumaker, 1991).

In large measure, the learning strategies research conducted over the last 20 years at the University of Kansas, Center for Research on Learning, has been funded by the U.S. Office of Special Education Programs. Additional funding has come from sources including the State of Kansas, The Casey Family Foundation, and the National Council for Learning Disabilities. The content of this publication does not necessarily reflect the views or policies of the funding agencies, nor does the mention of trade names, commercial products, or organizations imply their endorsement.

For further information on the University of Kansas Learning Strategies Curriculum, teacher training, and how to implement strategies instruction throughout a school, contact: Center for Research on Learning, University of Kansas, 3061 Dole Center, Lawrence, KS 66045, (785)864-4780 (www.ku-crl.org).

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